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NEWS LETTER

VOLUME VI

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UNITED STATES DEPARTMENT OF AGRICULTURE
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NEWS LETTER

FOR SEPTEMBER 1939

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ADMINISTRATION

Mr. Shaw Retires

On September 30 Harry B. Shaw retired after a quarter of a century in the foreign plant-quarantine service. Mr. Shaw was born at Huddersfield, England, and had had several years' experience with importing firms, the parcel-post service, and a business of his own before going to Colorado for his health. After regaining his health he accepted a position at Bremerton, Wash., with the Navy Yard, later being transferred to Washington, D. C. While stationed in Washington he studied medicine for 2 years, then was transferred to the Department of Agriculture and assigned to work with M. B. Waite. Mr. Shaw took an examination for scientific assistant in plant bacteriology. He received his first appointment as a scientist in 1907 and was assigned to work in Utah on curly-top disease of sugar beets. He carried out a series of experiments which proved that curly-top is transmitted by the beet leafhopper.[1/] He also made a careful study of the sugar beet nematode and its control.

In 1914 Mr. Shaw was transferred to the Federal Horticultural Board and took charge of the Board's work in New York, where he remained until 1925, when he was transferred to Washington and supervised much of the permit work for several years. With the increased importance of the export-certification work, it became necessary to have accurate and readily available knowledge of the plant-quarantine requirements of foreign countries. Mr. Shaw's knowledge of foreign languages, as well as of quarantines, quarantine procedure, and the routine of shipping from the viewpoint of commercial agents, resulted in his undertaking the task. His summaries of foreign-quarantine requirements are in constant use by other governmental agencies and by foreign organizations and exporters, as well as by this Department.

[1/] See U. S. Dept. Agr. Bur. Plant Indus. Bul. 181. The Curly-top of Beets. By Harry B. Shaw. (July 1910.)

See also Utah Agr. Coll. Expt. Sta. Bul. 155, p. 41 (1917).

FRUIT INSECT INVESTIGATIONS

Spray residues on peaches not excessive.--Oliver I. Snapp, of the Fort Valley, Ga., laboratory, reports that the results of analyses made by the Division of Insecticide Investigations show that the lead and arsenic residues on ripe Elberta peaches from Georgia, that had received the regular schedule of lead arsenate during the season of 1939, proved to be a little in excess of the tolerance when not brushed (0.0365 gr. Pb per lb. and 0.0108 gr. As_2O_3 per lb.), but brushing removed half of the spray residue, as usual, and reduced it well below the tolerance (0.0194 gr. Pb per lb. and 0.0059 gr. As_2O_3 per lb.). The peaches in the experimental plats received heavier applications of spray than those made by most growers, therefore the residues on unbrushed fruit from growers' orchards this year were probably below the tolerance. Practically all packing sheds in Georgia are equipped with brushing machines, the use of which makes certain that the residues will be well below the tolerances, where the peaches have been sprayed according to the usual schedule.

Internal staining of raisin moths for dispersion experiments.--An approach has been made to the problem of marking raisin moths (*Ephestia figulilella* Greg.) by allowing them to drink colored water. This method was devised by George H. Kaloostian, of the Fresno, Calif., laboratory. Nonpoisonous liquid food color was used at the rate of 1 ounce per gallon of water. Mr. Kaloostian made a feeder which consisted of a small bread pan in which 2 sheets of white blotting paper were supported in an upright position against the long sides of the pan, the lower portion of the sheets being immersed in colored water. A wooden cover, fitting between the pieces of blotting paper, excluded moths from the water. The insects took the colored solution from the wet blotting paper. Stained moths showed color as long as 8 and 10 days after having had access to the solution for 3 and 4 minutes. The color could be seen in the alimentary tract through the translucent abdominal wall. Field work included placing 19 feeders in a raisin storage and operating malt-sirup bait traps down-wind at distances of from 100 feet to 7 3/4 mile. Four stained moths were found among 629 captured during 18 days in June. Two of them were taken at 100 feet, 1 at 1 3/4 miles, and 1 at 2½ miles from the feeders.

MEXICAN FRUITFLY CONTROL

Fruitfly status in September.--In the early part of the month three adult *Anastrepha ludens* Loew were trapped in the Rio Grande Valley. No other Mexican fruitflies were taken throughout the month. The fruitfly population had remained higher in the regulated area this summer than in any other season on record, but from trap recoveries throughout late September there appeared to be no carry-over of flies from the previous season. General rains over the area naturally benefited the maturing citrus crop. Preliminary maturity tests revealed that harvesting could be started about October 1.

CEREAL AND FORAGE INSECT INVESTIGATIONS

White grub damage to lawns in Wisconsin.--T. R. Chamberlin and Lee Seaton, Madison, Wis., report that in a thorough search throughout south-central Wisconsin late in the summer, no cornfields were found to be materially damaged by white grubs. A less-thorough search in other parts of the State also failed to reveal damaged corn. Most of the injury by grubs this year was in lawns, strawberries, and raspberries. This situation differed considerably from that observed in 1936 when, as in 1939, grubs of brood "A" were in their second year, but caused widespread damage to corn and pastures rather than to lawns. The summer of 1938 was very wet and the pastures, in which most of the grubs in corn originate, remained muddy over long periods. It seems possible that in a season so wet as 1938, well-kept lawns are more favorable for establishment and survival of grubs, than are pastures and field crops.

Sao Paulo strain of Amazon fly introduced for sugarcane borer control.--T. E. Holloway and Ralph Mathes, of the Houma, La., laboratory, report that 40 mated females of the Sao Paulo strain of the Amazon fly (Metagonistylum minense Towns.) were received on May 24 at Houma from K. A. Bartlett, in Puerto Rico, for use as breeding stock. Data on inoculations and fly emergence for the 1939 season are as follows:

Date of inoculation	Borers inoculated	Flies emerged	
	Number	Number	Percent
May 25-29------	1,128	735	66.34
June 21-28-----	1,433	1,090	76.0
July 14-24-----	1,813	1,033	56.9
August 7-21----	2,757	[1] 318	[1] 11.5
Total--------	7,131	3,176	44.5

[1] Emergence low, owing to infestation by mites.

A total of 1,575 flies were released in 13 locations in Louisiana and 294 in 3 locations in southern Florida. In addition, 20 mated female flies were shipped to L. C. Scaramuzza for use as breeding stock at Fellsmere, Fla. This strain of fly is thought to be better adapted than is the Amazon River strain to lesser rainfall and lower temperatures, such as are found in continental United States.

Ladybeetle introduced for control of aphids.--Eighty-nine ladybeetles (Coleophora inaequalis Fab.) were received at the Houma laboratory from Mr. Bartlett, in Puerto Rico, on July 29. Breeding work was conducted to produce beetles for release for the control of Sipha flava Forbes and other aphids attacking sugarcane and other grasses. From this introduction J. W. Ingram, W. E. Haley, and L. J. Charpentier reared and released 1,064 larvae and 34 adults in sugarcane fields in 5 locations in Louisiana. Sixty adults were also shipped from Houma to Cairo, Ga., for release in sugarcane fields heavily infested by S. flava.

Sugarcane borer parasites in southern Florida.--Mr. Ingram and E. K. Bynum, of the Houma laboratory, report that in cooperation with J. W. Wilson, of the Everglades Experiment Station, they made a survey of parasitization of the sugarcane borer in southern Florida during the last of July. The average parasitization by Bassus stimaterus (Cress.) was 2.5 percent in the Lake Okeechobee area and 4 percent at Fellsmere. The percentage of parasitization by Bassus reached 11.1 in a field near Lake Okeechobee and 8 at Fellsmere. No other parasite was found in the Lake area, but an average parasitization of 10 percent of Lixophaga diatraeae (Towns.) was observed at Fellsmere. As harvesting of cane will not begin in southern Florida before November or December, these findings indicate that there may be a rather high rate of parasitization by harvest time.

Poisoned grasshoppers expelled from 10 to 86 percent of arsenic ingested.--C. C. Wilson and Alvin J. Cox, Sacramento, Calif., report that chemical analyses of grasshoppers (Melanoplus marginatus Scudd.) and their fecal and regurgitated matter showed that specimens killed within 1 hour after feeding on poisoned bait had ingested an average of 0.028 milligram of arsenic trioxide, 10 percent of which was regurgitated. Grasshoppers dying in 24, 48, and 72 hours after feeding on poisoned bait, contained an average of 0.0093, 0.011, and 0.007 milligram, with a loss of arsenic trioxide expelled or regurgitated of 19, 34, and 81 percent, respectively. Grasshoppers which had fed on poisoned bait and which were alive at the end of 144 hours contained an average of 0.001 milligram of arsenic trioxide, and had expelled 0.006 milligram of arsenic trioxide, or 86 percent, in their fecal and regurgitated matter. Unpoisoned grasshoppers that had been fed green alfalfa contained the merest trace of arsenic trioxide in the insect and in the fecal and regurgitated matter.

Multiple-generation strain of corn borer in northwestern New Jersey.--According to C. A. Clark, Moorestown, N. J., it has been stated that only the single-generation strain of the corn borer was present in northwestern New Jersey. Examinations in the fields in Hunterdon, Warren, Sussex, and Morris Counties showed conclusively that the multiple-generation strain of the borer is present in these northwestern counties.

Second-generation infestation in field corn in New Jersey.--Mr. Clark also reports that a few very heavily infested fields of late corn were observed in central New Jersey and population counts were made, the results of which are shown in the following table.

Field No.	Township	Plants infested[1]	Average borers per plant[2]
		Percent	Number
1	Burlington	100	16.3
2	Burlington	100	25.0
3	Monroe	100	18.9
4	Willingboro	100	[3] 40.3

[1] Twenty-five plants in each quarter of field examined.

[2] Average of 10 infested plants dissected.

[3] Two other fields on same farm almost as severely infested.

Substitute products for gall-nut tannin in dual-fixed nicotine dust.--C. H. Batchelder, New Haven, Conn., reports that field-plot experiments conducted at New Haven indicate that both myrobalans tannin and powdered extract of quebracho wood are satisfactory substitutes for Chinese gallotannin when used in preparations of dual-fixed nicotine dust. The two experimental preparations were compared with dual-fixed nicotine of the gall-nut tannin type in tests with early sweet corn infested by the first generation of the European corn borer.

JAPANESE BEETLE CONTROL

Japanese beetle inspection activities.--Among plant material inspected and certified during September were 26 bamboo trees grown on Long Island, N. Y., and certified for shipment to Federal engineers in Florida to be tested for hurricane protection. Twenty thousand gerbera plants were also certified from Long Island for movement to Florida, after washing of the roots under pressure to remove all soil. In the northern section of the New York City area, 20,000 soil-free peony-root divisions were certified for shipment to North Carolina. Inspections were made in the Norfolk, Va., area of displays of peanut vines to be shipped to all parts of the United States. An enormous increase in the truck movement of potatoes from central New Jersey stepped up the inspection and certification of this commodity. Several large nurseries on the Eastern Shore of Virginia began their fall shipping season in September. One large peony shipper has required almost daily inspections since the latter part of August and numerous inspections of strawberry plants were made during the month. Finding of Japanese beetles on several large Eastern Shore nurseries will necessitate the retention of one temporary inspector in addition to the usual force carried through the fall shipping season.

Plants certified on basis of methyl bromide fumigation.--Fumigation of potted strawberry plants continued through the month in the New York City area and a shipper of azaleas started using this method for certification purposes. A few scattered treatments were made in New Jersey of azaleas, general greenhouse plants, nursery stock, perennials, and roses. One shipper in the Philadelphia area discontinued maintaining a greenhouse and a lead-arsenate-treated heeling-in area in a certified status and is depending upon his fumigation chamber to fill all his requirements for certification. Another has relinquished certification of a greenhouse and will construct a fumigation chamber in time for use during the spring shipping season. Shipments of perennials are moving quite briskly from the Philadelphia area, owing in part to the ability of some nurseries to book outside orders of plants that previously could not be moved with the soil removed, but can now be successfully fumigated to rid them of possible infestation. A nursery in the Pittsburgh, Pa., area with an outlet in one of the large Pittsburgh department stores has made inquiries concerning the construction of a fumigation chamber. This nursery recently relinquished its classified status after finding Japanese beetles widely scattered throughout their property.

Restrictions on farm products lifted.--Seasonal restrictions on the movement of farm products were lifted at midnight on September 19. Adult beetles had rapidly disappeared since late in August and had ceased their flight throughout the area by the middle of September. All inspectors of farm products were dismissed. A few of the temporary inspectors were retained to continue inspection of cut flowers, the restrictions on which remained in effect until October 15. Fumigation of empty refrigerator cars at Philadelphia for subsequent loading with fruits and vegetables was discontinued after September 2, with the requirement for screening of vents continuing until September 9. Carload fumigation at Philadelphia was available during the season at Piers 5 and 9, North, at scattered locations along the river front, and at the Pennsylvania Railroad produce terminal. At the Edgemoor Yards, near Wilmington, Del., fumigation of loaded refrigerator cars was discontinued on September 9, following cessation of adult flight in the vicinity of the loading points on the Del-Mar-Va Peninsula. The farm products inspection platform at Fredericksburg, Va., was dismantled on September 17 and inspections were discontinued at that point on that date.

Nurserymen complete 17 methyl bromide fumigation chambers.--There are now 17 methyl bromide fumigation chambers completed and operating in nurseries throughout the Japanese beetle regulated area. Three additional chambers are almost completed and will start operation in the near future. Twelve other establishments have indicated their intention of starting construction. A total of 30,094 plants were fumigated in September, bringing to 362,717 the total number of plants fumigated since this procedure was authorized. Contact calls have been made at interested nurseries to acquaint them with the latest developments in chamber constructions and to furnish them with available data on the requirements for fumigation. Demonstrations have been arranged for this fall and winter in Connecticut and Massachusetts. Demonstrations in Maryland and New York are scheduled for early in October.

Soil treatments at isolated infestations.--Application of lead arsenate for Japanese beetle control was in progress during September in Chicago and Evanston, Ill.; Detroit, Birmingham, and Grosse Pointe Farms, Mich.; and Wilmington, N. C. Treatments in Chicago were started on July 31 and by the end of September 56.4 acres had been treated. In Evanston 3 acres of soil were treated on September 28 and 29. Soil-poisoning operations were started in Detroit on September 25, with 7.4 acres covered by the end of September. At Grosse Pointe Farms 2.3 acres were sprayed on September 18 and 19 and at Birmingham 5.2 acres were treated between September 20 and 22. In Wilmington, N. C., treatments started on September 25, with a coverage of 11.4 acres by the end of the month. Treatments in Chicago, Detroit, and Wilmington were continued into October.

Delaware distributes beetle traps.--During the past summer the State of Delaware furnished property owners in the State with 1,000 Japanese beetle traps. Observations showed that the entire State was more heavily infested than in previous years.

District of Columbia infestation.--The latest collection of adult Japanese beetles in the District was reported on September 29. The earliest reported find was made on June 9. Infestation in the District was observed as heavier than last year, particularly in the Benning-Anacostia section. Beetles are now scattered throughout all sections of the city.

Trapping for Japanese beetle at Virginia Truck Experiment Station.--Records covering catches in 24 traps operated at the Virginia Truck Experiment Station at Norfolk show a small but steady increase in the number of beetles caught during the last 3 summers. Starting with trap collections of 44 beetles in 1937, the captures increased to 109 in 1938 and 280 in 1939.

Marked increase in beetle infestations in New England nurseries.--Japanese beetle finds in New England nurseries, particularly in Connecticut, indicated a marked increase in infestations over last year. Infestations were found on 21 classified nursery and greenhouse properties in Connecticut and on 37 sources of potting soil and manure supplying Connecticut classified establishments. In addition, infestations were found on 2 nurseries in Rhode Island, 6 in Massachusetts, and 1 in New Hampshire.

Government greenhouses moved.--Considerable certification work was performed in connection with the Bureau of Plant Industry's transfer of their experimental greenhouses from the old location on the Mall at Constitution Avenue and 14th Street, Washington, D. C., to the National Agricultural Research Center at Beltsville, Md. Portions of the stock are certified and portions uncertified. This required considerable checking to assure that the 2 types of material were properly segregated. At the Constitution Avenue location the Bureau of Plant Industry operated 19 certified units, comprising a total of 42,400 square feet of glass. In addition, there was a total of 32,800 square feet of uncertified glass.

World Fair inspection.--One of the inspectors from the New York City district office visited the World Fair grounds to contact possible shippers of quarantined plant material at the close of the Fair on October 31. Arrangements were made to take care of the Florida State exhibit, including many plants of unusual character to be returned to that State. Certification of small plants from a number of the Fair concessions greatly diminished after school started. Visiting students apparently made many of the purchases of these plants for mailing to points outside the infested area.

Some real intercepting of contraband.--Late in August transit inspectors collaborating with the Bureau in Jacksonville, Fla., reported the interception of small quantities of uncertified farm products in ships' stores aboard the S. S. Sacarappa of the South Atlantic Line and the American S. S. Shickshinny. On the same day that an inspector of this Division interviewed the Baltimore, Md., ship chandler who furnished the uncertified produce, a newspaper article reported that the cargoes of these two freighters had been seized by the British. The ships had sailed from Savannah, Ga., reportedly bound for German ports.

Spurt in corn borer certifications.--Shipments requiring European corn borer certification in the Philadelphia area showed a sizable increase. Most of this increase was in the number of cut-flower shipments. Value of the shipments doubled over those made in August. Similar inspections of cut flowers almost doubled over last season in the Baltimore, Md., district.

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Lumber heavily infested with gypsy moth inspected.--Ninety-five of a total of 153 gypsy moth egg clusters found in products inspected during the month were removed from 4 carloads of lumber inspected at Conway and Center Conway, N. H., for shipment to St. John, New Brunswick, Elizabethport, N. J. (1 car each), and Rochester, N. Y. (2 cars). At Danvers, Mass., 33 egg clusters were removed from birch sticks to be used in the manufacture of novelties for shipment to points outside the regulated area. Infestations of single egg clusters each were found in 6 lots of nursery stock inspected at establishments in Massachusetts, Rhode Island, and Connecticut. At Hyannis, Mass., 2 tank cars that had been held on a spur track over the egg-laying season were inspected by the district inspector before movement to Sharon, Pa., and 10 gypsy moth pupae and 1 egg cluster were removed from the cars.

Log for scientific study refused gypsy moth certification.--During September a 4-foot log and 32 pieces of bark were presented for inspection at Petersham, Mass., prior to shipment to the Idaho State College at Moscow, for study of a fungus disease. The pieces of bark were found free from infestation, but under a loose section of the bark of the log 2 gypsy moth egg clusters were found. In order to creosote and remove these egg clusters, removal of the bark was necessary. Because shipment of the log intact was desired, certification for its movement to Idaho was refused.

Dutch elm disease scouting completed in Pennsylvania and isolated infected areas.--The scheduled scouting program in Pennsylvania was completed during the last week in September. The work in Bucks, Monroe, and Northampton Counties was mainly along rivers, streams, highways, and railroad rights-of-way. In Bucks County a special problem area developed, owing to flooding of an elm concentration by a lime-manufacturing plant. Close checking has not disclosed any concentrations of elms containing wood subject to bark-beetle attack in Lehigh County, where an infection was found in one township, but several large areas containing possible beetle material were found in Milford Township, Bucks County, near the point of infection in Lehigh County. In Allegany County, Md., and Mineral County, W. Va., systematic scouting terminated at the end of the September work period for security workers. In these sections the assigned area was scouted twice and a third check was made in the localities in which infected trees had been found. In the Indianapolis, Ind., area scouts were shifted from systematic scouting for diseased trees to surveys for elm material that may harbor the insect carriers of the fungus. In the Athens, Ohio, area, scouting by automobile and on foot was still in progress the last week in the month.

Dutch elm disease scouting continued.--W. P. A. scouts continued their activities through September, with a gradual tapering off toward the end of the month preparatory to switching over to the winter elm-sanitation program. Seasonal changes in foliage made scouting for elms showing symptoms characteristic of the disease quite difficult. Despite the advancing fall season, scouting was continued in Connecticut until the second survey of the infected zone was completed. In some sections it was necessary to sample all elms that appeared to be in an unthrifty condition. In some of the northern localities of the work area systematic scouting was discontinued by September 22 because of foliar changes that masked any disease symptoms.

Bark beetles attack green elms.--Crews engaged in elm-sanitation work in the Ancramdale Swamp in Columbia County, N. Y., report that nearly every elm in the swamp contains bark beetles in various stages of development. Active beetles were noted trying to enter elms in all stages of vitality. Some beetles were entering the trunks of green elms and then backing out. In elms more suitable for their development larvae were making galleries. The same condition was noted in another swamp in Columbia County.

Four incipient Dutch elm disease infections reported.--First-record infections reported during the month of September were limited to confirmations of one tree each in Warrington Township, in Bucks County, and Middle Smithfield Township, in Monroe County, Pa., and in the towns of Kirkwood and Sanford, Broome County, N. Y. These four districts are contiguous to townships in which confirmations had previously been found.

FOREST INSECT INVESTIGATIONS

Preliminary work on phloem necrosis disease of elm.--D. E. Parker, of the Morristown, N. J., laboratory, spent the period from August 15 to September 9 in southern and central Ohio. He visited a number of areas where a phloem necrosis has caused the death of many elms. The mode of transmission of the cause of this phloem necrosis, which is thought to be a virus, is not known but insects are suspected. Specimens of various insect species associated with elm in the areas were collected and notes made concerning them. The specimens represent numerous species of Homoptera and some species of Coleoptera, Heteroptera, and Orthoptera.

Low temperatures fatal to Scolytus multistriatus.--In April 1939 A. E. Lantz, of the Morristown, N. J., laboratory, exposed short elm sticks containing overwintering larvae of the smaller European elm bark beetle (Scolytus multistriatus Marsh.) to certain low temperatures. The sticks and untreated check sticks were then placed in individual containers and records kept of the number of beetles that emerged. After emergence was over the bark was removed from the sticks and the number of larval tunnels counted.

Lowest subcortical temperature reached (°F.)	Percentage of larval tunnels giving beetles
+ 25	38.4
Check	40.2
+ 10	15.3
Check	39.6
0	12.2
Check	39.2
- 10	3.9
Check	34.3
- 19	0
Check	62.5

The experiment indicates that all larvae will be killed in April at a subcortical temperature between -10° and -19° F.

Plans made for collecting spruce sawfly cocoons.--P. B. Dowden and W. F. Sellers, of the New Haven, Conn., laboratory, report that detailed observations were continued at the heavily infested spruce sawfly study plots in Marlboro, Vt., until September 22. At that time practically all healthy larvae had spun cocoons and feeding was at an end. Disease killed a tremendous number of larvae toward the end of the season, but on the outskirts of the heavily infested area large numbers of larvae completed development and spun cocoons. Several areas were located which should be suitable for large-scale collections of cocoons. This work will be done by C. C. C. boys under the direction of F. E. Miller, Jr., and the cocoons will be used by the Northeastern States for rearing the cocoon parasite Microplectron fuscipennis in 1940. Two lots of Neodiprion fulviceps (?) cocoons collected at Newcastle, Wyo., by members of the Fort Collins, Colo., laboratory, were received at New Haven on August 30 and September 13. Although most of the parasites should issue from these cocoons in the spring of 1940, about 50 adults of Spathimeigenia spinigera (?) have issued this fall. About 100 larvae of Diprion polytomum Htg. were attacked by this tachinid parasite, which was successfully reared on D. polytomum under laboratory conditions in 1937.

Beech scale increases in Northeast.--L. D. Casey, of the New Haven, Conn., laboratory, reports that examination with J. R. Hansbrough of the Division of Forest Pathology, Bureau of Plant Industry, of the beech scale-Nectria permanent sample plots in eastern and central Maine this year showed that the scale has built up considerably in most of the plots, as compared to 1938, and has also spread to a number of trees not infested previously. There are still two of the plots, one at Orland and one at China, in which no scale has yet appeared. There is no increase in the number of dead or dying beech in the plots this year. In traveling between plots no areas of dead beech were noted. In most of the plots there was an increase in the degree of Nectria infection and in the number of trees affected by it. A heavy beech scale infestation was discovered north of Medway, Maine, and extending along the eastern side of Highway No. 11 for about a mile. A few trees with heavy Nectria infection were noted. This infestation is about 25 to 30 miles north of the previously known range of the scale. The scale is apparently distributed over the whole of Westchester County, N. Y. In most places the infestation is light, although a few trees possessed a medium infestation. A few lightly infested stands in Rockland County, N. Y., were visited. Rockland County borders on the western bank of the Hudson River and is just north of the New Jersey State line. In the Bartlett, N. H., experimental forest of the Northeastern Forest Experiment Station, one tree has been found heavily infested with the beech scale. This is the first record of beech scale occurrence in the White Mountain region of New Hampshire.

Control of the mountain pine beetle in white pine.--A survey of the Coeur d'Alene National Forest conducted during August 1939 by the Coeur d'Alene laboratory revealed a severe infestation of the mountain pine beetle within the white pine stands of the Yellow Dog and Downey Creek units. In this area of some 15,960 acres there are approximately 10,000 infested trees. Funds were requested by the Forest Service for a control project. An allotment of $42,000 was received on September 19 and 5 50-man camps had been established and fully manned by September 27. C. C. C. enrollees will be used to treat 3,000 of the infested trees with the allotted funds being used in areas less accessible to the camp. This project will be completed early in November.

Large tree produces many mountain pine beetles.--During the last 3 years western white pine trees infested with the mountain pine beetle have been felled and examined within definite study areas on the Coeur d'Alene National Forest. Among the trees examined last season, according to W. D. Bedard, of the Coeur d'Alene, Idaho, laboratory, was one 41.3 inches in diameter, 219 feet tall, and well over 300 years old, which contained 1,010 square feet of infested bark. In this tree there were 4,688 attacks and 6,516 feet, or more than a mile, of egg gallery, which produced a total of 99,850 new adult mountain pine beetles. Considering the average of all trees examined during the season, the new adults produced in this 1 tree would be sufficient to attack successfully 51 average trees.

Black Hills beetle on increase in Utah.--Donald De Leon, of the Fort Collins, Colo., laboratory, reports an increase to epidemic proportions of the Black Hills beetle in lodgepole pine on the Wasatch National Forest, Utah. Considerable control by the burning-standing method was carried out during 1935 and 1936. No control work was done during 1937 and 1938 and already in some areas the present infestation is as heavy as one or two trees per acre. On the Powell National Forest, Utah, where partial control has been carried out for the last 3 years, there is still considerable infestation in the drainages not yet treated. In some areas the increase appears to be as high as three to one.

Experimental control measures effective against cottonwood borer.--Six different materials were tested by N. D. Wygant, Ft. Collins, during the latter part of July near Elk City, Okla., against small larvae of the cottonwood borer (Plectrodera scalator Fab.) in 2-year-old cottonwoods. These materials are listed in order of effectiveness, giving the number of larvae in each test and the percentage of mortality obtained. (1) Trichlorobenzene 25-percent emulsion, 27 larvae, 100-percent mortality. (2) Transparent penetrating creosote 25-percent emulsion, 18 larvae, 100-percent mortality. (3) Orthodichlorobenzene 16 2/3 percent and naphthalene 8 1/3-percent emulsion, 43 larvae, 95-percent mortality. (4) Orthodichlorobenzene 25-percent emulsion, 22 larvae, 91-percent mortality. (5) Ethylene dichloride 25 percent emulsion, 44 larvae, 70-percent mortality. (6) Paradichlorobenzene crystals, 27 larvae, 33-percent mortality. (7) Check, 41 larvae, 15-percent mortality. Between 1/3 and 1/2 ounce of spray was applied to the base of each tree. As yet the treatments have had no apparent toxic effect on the trees; however, they should be tested more thoroughly under a variety of conditions to be absolutely sure of their safety. Asphalts, asphalts with arsenate of lead, raw linseed oil with lead arsenate, and raw linseed oil with Bordeaux mixture painted on young cottonwoods during June had no repelling action against oviposition by the cottonwood borer.

GYPSY MOTH AND BROWN-TAIL MOTH CONTROL

Conditions favorable to gypsy moth work in September.--In each State where Federal gypsy moth work is conducted efforts are being made to build up to the full quota of workers which, it has been estimated, could be carried after the change in pay rates which became effective on September 1.

Additional scouting work was begun in Connecticut around infestations that had been sprayed or otherwise treated during the last fiscal year. Ground work, which includes the picking up and burning of dead wood and other trash, greatly facilitates the reexamination of these localities. Although working short-handed in some sections, scouting was well under way in Vermont by the middle of September. Working conditions steadily improved with the advent of cooler weather and the beginning of light frosts, which started the shedding of foliage and the appearance of considerable color on the upper hardwood slopes in the mountainous areas. Snow fell for several hours in northern Vermont on September 26, blanketing the lower elevations under an average depth of 2 inches. Heavy rain, which fell over the remainder of the area where gypsy moth work is performed during the first part of the last week in September, interfered with the performance of field work. However, the rain reduced the fire hazard to a negligible degree, so that it was feasible to burn accumulations of brush and other waste wood immediately after the weather cleared.

Small gypsy moth infestation found in Vermont barrier zone.--A scouting crew working in Warren Township, Washington County, Vt., located a small gypsy moth infestation about the middle of September, but no attempt was made to determine its extent. Closer work will be started later at this location, when forest conditions are more favorable for locating hidden egg clusters. Warren Township is located just within the border of the barrier zone in the north-central portion of Vermont.

Infestations in barrier zone started by wind-spread of caterpillars.--The continued discovery of widely scattered new gypsy moth egg clusters in townships bordering the barrier zone in Massachusetts, together with the scarcity of old egg clusters, demonstrates that there was considerable dispersion of gypsy moth caterpillars by the wind during the last year. Where this condition occurs, scouting work is done both inside of the barrier zone to eliminate the infestations, and outside of the barrier zone line to reduce infestations in favorable locations for wind-spread to points within the barrier zone. In Blandford, which is just outside of the barrier zone in Massachusetts, a gypsy moth egg cluster was discovered inside of a rural mail box at the roadside, while the nearest other egg cluster was found in an apple tree about 300 feet distant. Infestations located in woodland recently logged off present difficult problems, as the tangles of slash and top wood left after the lumbering operations greatly increase the work necessary to clear up the gypsy moth colonies.

Late observations of gypsy moth egg deposition.--A female gypsy moth was discovered depositing eggs on September 13 in Cummington Township, Hampshire County, Mass. A similar observation was reported from Pennsylvania at about the same time. This is unusually late, as practically all egg clusters are usually deposited by the end of August.

Unusual conditions complicate gypsy moth work at Connecticut infestation.--Large numbers of various stages of species of lepidopterous insects other than the gypsy moth were found in the shagbark hickory trees which abound in and near the gypsy moth infestation which was located in Southbury Township, New Haven County, Conn., late in June. From a distance the larvae and molt skins of some of these insects resemble gypsy moth egg clusters, especially when partly hidden under the loose bark of the hickory. For this reason, it was necessary to climb most of the hickories in order to insure that no gypsy moth egg clusters should be overlooked.

Dry season permits early scouting of swampy areas.--Several gypsy moth crews in Connecticut scouted in areas which are normally swampy and usually accessible only when frozen over. The dry weather prevalent throughout New England during the last 4 or 5 months made it possible to work at these locations early in the season.

Small infestation located in Connecticut section of barrier zone.--A small gypsy moth infestation was recently found in Woodbury, located within the barrier zone in the southern part of Litchfield County, Conn. So far as is known, this is the first gypsy moth colony ever located in the township.

Gypsy moth work in Pennsylvania.--By September 1 the force of W. P. A. workers engaged in Federal gypsy moth work in Pennsylvania had been reduced to 58 men because of the necessity of dismissing all workers, except veterans, who had completed 18 months of continuous service. As a consequence, only a skeleton force was available for assignment to the various activities during the first part of the month. Many of the new workers requisitioned to fill the vacancies were inexperienced and required training in heavily infested areas before being assigned to regular gypsy moth work. The men available began, during the last week in August, to remove the assembling cages where no male gypsy moths were caught during the season. They continued to patrol the remaining cages, gradually collecting all those in locations where no further recoveries of male moths appeared likely, until the middle of September, when the removal of the cages was completed. Scouting work was started around infested sites, and the examination of trees, brush, driftwood, and other debris along the banks of the Susquehanna and Lackawanna Rivers where they pass through the generally infested area was begun. The scouting of the river banks was facilitated by the low water caused by the prolonged dry season, and all islands were easily reached either by walking across dry stream beds or by wading through very shallow water. However, this work progressed slowly because of the shortage of men experienced in this type of work and who were able to comply with the new W. P. A. regulations. Men working in the vicinity of abandoned mines were constantly on guard against stepping into mine cave-ins, as the openings are often small and completely screened by bushes and weeds. These holes are usually very deep, and if a man fell into one of them he might suffer severe injury and would have difficulty in getting out without assistance. A few workers in Pennsylvania were also engaged in quarantine-inspection work and in other special assignments.

C. C. C. gypsy moth work.--During the month of September a total of 2,832 6-hour man-days were used on C. C. C. gypsy moth work east of the barrier zone under the supervision of this Bureau, while 7,170 6-hour man-days were diverted from gypsy moth work and used on forest-fire-hazard-reduction work. Of the man-days taken from gypsy moth work, 4,654 were in Massachusetts, 512 in Connecticut, and 2,004 in Vermont. As usual during this season, the work consisted mainly of creosoting egg clusters and selective thinning to reduce the favored food plants at the sites of known infestations. Very little scouting will be done while the foliage remains too heavy to obtain the best results from this type of work. A crew from one of the camps in Vermont, where no gypsy moth work has been done since the hurricane of 1938, was returned to gypsy moth work in September. During the first quarter of the fiscal year, ended the last of September, a total of 10,301 6-hour man-days was used on gypsy moth work, resulting in the destruction of 20,505 new gypsy moth egg clusters found while scouting a total of 3,107 acres and doing selective thinning work on 467 of those acres.

PLANT DISEASE CONTROL

Common and native barberries found in Montrose County, Colo.--Since survey work started in Montrose County in April, 1 agent with a crew of 4 men has covered approximately 150 square miles in the western part of the county where areas of both common (Berberis vulgaris) and native (B. fendleri) barberries have been found. Large and small escaped bushes have been found along fence rows, in orchards, on hillsides, and on ditch and river banks. Bushes found in orchards growing close to trees were dug, others were salted. Twenty-six farmers have assisted in the eradication of 456 bushes on 25 properties. Of these bushes, 374 on 24 properties were escapes. Farmers in southwestern Colorado, in the 5 counties where work is being carried on, have cooperated by furnishing storage space for salt and equipment, by assisting with the work, and by furnishing teams and tractors.

Supervisors in Iowa counties cooperate in barberry eradication.--Before barberry-eradication work is started in a county, a meeting is held with the County Board of Supervisors and the work explained in detail. A request is usually made for some financial assistance, usually for funds to be used in paying for transportation of crews or for hauling chemicals and equipment. County Boards have furnished ½-ton and 1½-ton trucks, including gas, oil, and upkeep, and allotments of funds to pay for (1) personally owned car mileage; (2) gas, oil, and storage for government trucks; and (3) leather boots for laborers. These boards of supervisors are usually glad to be of assistance in this work, as it hastens the removal of barberries growing within the county. The amount of financial assistance has not been great but the work has been very helpful, as it creates added interest in the project and helps to keep in touch with the members of these Boards as well as with other county officials interested in crop improvement. During the last summer 9 of the 12 counties in which work has been conducted have furnished some assistance. In 7 counties funds were allotted for maintenance and upkeep of cars, and in 3 counties leather boots were purchased for laborers. Direct aid from counties has amounted to approximately $2,300 since January 1 and for the present year it will average about $300 each month, exclusive of the leather boots that have been furnished.

Eradication work extended into Augusta County, Va.--The first countywide survey for common barberry bushes in Augusta County, was initiated last month. Work began at Steele's Tavern and will continue northward. In 1935, winter wheat was seeded on 44,556 acres and 13,734 acres was seeded to other small grains in the county. Forty percent of the crop land harvested was planted to small-grain crops.

Exhibits placed at county fairs.--Educational exhibits on barberry eradication and stem rust control were maintained at five county fairs in Virginia from August 22 through September 23. Eradication of native barberry (*B. canadensis*) was stressed in the exhibits at Radford (Montgomery and Pulaski Counties), Galax (Carrol and Grayson Counties), and at Fincastle in Botetourt County, while the common barberry (*B. vulgaris*) was featured in the Rockbridge and Augusta County fair exhibits at Lexington and Staunton. In all cases the fair officials were very helpful and were anxious that we plan to place exhibits next year. Several tips were received on suspected common barberry locations in Rockbridge and Augusta Counties. Some of these locations have already been checked and common barberries located.

Reconnaissance of foxtail pine carried on in California.--During August, members of the regional office of blister rust control at Oakland, Calif., and the National Park Service left the Giant Forest in Sequoia National Park with saddle and pack stock to make a reconnaissance of stands of foxtail pine (*Pinus balfouriana*) and other white pines of the Kern River basin in the High Sierra of California. The objectives of the trip were to study the distribution of foxtail pine and other white pines and *Ribes*, to report upon the general problem of blister rust control in the pine stands of the region, and to make preliminary recommendations as to possible blister rust control units. The basin of the Kern River in Sequoia National Park is accessible only by trail from both the western and eastern sides of the Sierra Nevada, hence all operations were conducted on foot or horseback. Two famous trails traverse the region, the John Muir Trail and the High Sierra Trail. Foxtail pine is found only in a few localized places in California, one of which is the upper Kern basin, where it reaches its best development and is the dominant white pine; hence in this region it is of notable botanical interest. Magnificent stands of this pine are traversed by the two principal trails serving the basin. Foxtail pine in its mature habit is a full-bodied, bushy-crowned, irregularly branched tree from 35 to 60 feet high, with a bright reddish-brown bark. On many of the trees the branchlets hang pendant from the branches or often project from them at all angles, even vertically on the younger trees, thus giving the foxtail effect and the name to the tree. The usual diameter is from 20 to 36 inches but trees were observed that measured nearly 5 feet in diameter. It is distinctly a timber-line tree, climbing the shoulders and slopes of the granite mountains, where it is the last vestige of tree growth. At timber line it is occasionally associated with white-bark pine (*P. albicaulis*), which seems to compete with it for altitudinal record. Foxtail is not restricted, however, to timber line; it grows in pure stands considerably below the limit of tree growth. It prefers rocky sites and sandy, well-drained soils, which it finds to perfection on sandy granite slopes, talus slopes, and moraines. From its unfailing presence on moraines and other glacial debris, where it grows nearly pure, it might be named the moraine pine. Where moisture persists the year round, as in the valley bottoms and moist swales, foxtail gives place to lodgepole pine. Its altitudinal range lies between 8,500 feet and timber line, which is roughly 12,000 feet, but most of the pure stands lie above 10,500 feet. Below 10,500 feet it is mixed with various proportions of lodgepole pine. The species of *Ribes* that were observed associated with foxtail pine are, in numerical order, Ribes montigenum, R. cereum, and R. inerme. R. montigenum frequents moist situations among the lodgepole, seepages among the rocks, and draws at the heads of streams taking their origin in springs. Although some bushes of this species will offer resistance to eradication because of their rocky habitat, most of them can be eradicated without great effort. R. cereum habitually grows among the rocks; generally, however, it is not abundant. R. inerme apparently has an intermittent distribution; undoubtedly it is abundant in places along some of the streams.

Infected Ribes again found in Glacier National Park.--For the second year blister rust on Ribes has been found in Glacier National Park. Collected for the first time in 1938, steps were taken immediately to start survey and control work this year. This work is progressing satisfactorily on selected areas around the Park headquarters at Belton and at the head of Lake MacDonald, and on certain limber pine stands at Two Medicine Chalet. During August, C. C. C. workers cleared 848 acres of 145,941 bushes. It is expected that this work will continue until about October 15. Most of the rust has been located by scouts and control supervisors, all having been collected east of the Continental Divide and mostly on the Two Medicine campground area. It has been collected on Ribes viscosissimum and R. inerme leaves which with R. lacustre constitute the host bushes associated with Pinus flexilis at this location.

Ribes eradicated from over 77,000 acres in Northwest.--With a total of from 900 to 1,300 security-wage earners on the Bureau's blister rust control program and an additional 2,500 to 3,000 regular, W. P. A. and C. C. C. workers employed by the Forest Service and National Park Service, the season's accomplishments to the end of August showed 77,646 acres were protected by Ribes eradication. Of this total 27,961 acres, or 36 percent, is initial work and the remainder rework. In this acreage is included a large amount of cutover land where logging and burning disturbances have caused abundant Ribes germination. The average number of bushes per acre for all areas worked this year is 284. A summary of the acreage covered by each agency is as follows: Bureau, 30,003; Forest Service, 29,912; C. C. C., 15,008; State Cooperative, 2,723.

Blister rust exhibits attract attention at fairs.--Attracting visitors from the area immediately adjacent to extensive stands of western white pine timber, about 2,000 people viewed the blister rust exhibit at the Clearwater County, Idaho, Fair on September 15 and 16. Displayed in a bough-decorated booth were 25 colored pictures showing the disease, control methods, and camp life, the working tools of eradicators, and specimens of the disease on pine and Ribes. In addition, the story was presented with a continuous showing of colored slides. A new attraction which proved very successful was the use of 4-inch-lens hand magnifiers for close inspection of leaf infection. These proved particularly attractive to students, many of whom had their first opportunity to examine closely a disease they had studied in the classroom. Most visitors with whom the exhibit attendant talked have some knowledge of the disease and its control and are aware of the importance of white pine to Clearwater County and the State of Idaho. A blister rust control exhibit was placed in the Plants and Flowers Building at the Wisconsin State Fair, held on August 19 to 27, inclusive. This display attracted considerable attention. A blister rust exhibit at the Vilas County Fair held in Eagle River, Wis., was seen by approximately 20,000 people. In Minnesota blister rust control exhibits were shown at 4 county fairs--3 in the St. Paul district, and 1 in the Duluth district. In Michigan a new blister rust exhibit was displayed at the State Fair, Detroit, Saginaw County Fair, Lenawee County Fair at Adrian, and the Hillsdale County Fair. The total attendance at these fairs was approximately 680,000 people. Much interest was displayed in the various exhibits. A. C. White, of Rhode Island, reports that the blister rust control demonstration at the State Fair at Kingston, R. I., was a great success this year and attracted more attention than ever before. The display showed a blister rust panel with an infected white pine and currant and gooseberry bushes in flower pots with narrow red ribbon running from the bushes to the panel and infected pine. There were from 2 to 4 men in attendance every day of the fair to answer questions and give information to interested persons. Many inquired about planting white pine.

Blister rust infection goes up in smoke.--H. E. Swanson, in charge of blister rust control in the Northwestern Region, writes that while he was on the Kaniksu National Forest during the latter part of September, the Forest Service burned a slash area, sending up in smoke more blister rust infection per acre than, in his opinion, was ever known in the history of blister rust control. He states that there were 120 acres in this particular area that was burned and he would estimate that 500,000 infected white pines and 360,000 infected *Ribes* were burned up during 1 afternoon. The area was burned absolutely clean and the fire was so hot that no *Ribes* germination is expected.

COTTON INSECT INVESTIGATIONS

Effects of some insecticides on cotton leaf aphids.--Studies were made this season by R. C. Gaines, M. T. Young, and assistants at Tallulah, La., and by F. F. Bondy, C. F. Rainwater, and assistants at Florence, S. C., on the effects of a number of arsenical and fluorine insecticides used in boll weevil control experiments on cotton leaf aphid populations. The aphids (principally *Aphis gossypii* Glov. with probably some *A. medicaginis* Koch) were more abundant than average in both localities and most of the treated plots became sufficiently infested toward the end of the dusting period to need aphid control. All the insecticides were applied as dusts, as needed for boll weevil control, the number of applications ranging from 3 to 8, depending on the intensity of the weevil infestation. The plots ranged in size from 1/30 acre to 1 acre, and were arranged in blocks selected at random and Latin squares with from 2 to 6 replications. At Tallulah the populations were determined several times during the season by counting the numbers of aphids on 1 square inch of leaf surface on the fourth leaf from the tops of the plants. One hundred leaves collected at random were counted on each plot, making a total of 100 square inches of leaf surface per plot for each count. At Florence the experiments were designed to determine whether nicotine bentonite and nicotine tannate mixed with calcium arsenate in equal proportions, and 0.5 percent rotenone added to several fluorine insecticides, would prevent development of a damaging aphid population when used throughout the season for boll weevil control. Populations were calculated for the entire leaf surface of 100 leaves per plot, selected at random from among the fourth leaves from the tops of the plants. No checks were used in the Latin squares at Florence but calcium arsenate was used in all experiments at both localities and can be used as the basis for comparison with the other insecticides. The figures given below are an index of the relative abundance of the aphids in the different treatments from the counts made when the populations were at or near their maximum. Considering the aphid populations in the plots dusted with calcium arsenate as 1, the relative populations in the comparable plots in the other treatments were as follows: In the Tallulah experiments--checks, 0.28; 1-1 mixture of calcium arsenate and sulfur, 1.1; 1-2 mixture of calcium arsenate and sulfur, 1.1; sulfur, 1.6; synthetic cryolite (88-89 percent Na_3AlF_6), 1; synthetic cryolite (33 percent Na_3AlF_6), 0.64; synthetic cryolite (88-89 percent Na_3AlF_6) plus Lethane spreader, 0.79; synthetic cryolite (83 percent Na_3AlF_6), 0.15; calgreen, 1.2; di-calcium arsenate, 1.8; basic copper arsenate, 0.64; a French commercial calcium arsenate, 0.96. In the Florence experiments--1-1 mixture of calcium arsenate and nicotine bentonite, 0.41; 1-1 mixture of calcium arsenate and nicotine tannate, 0.50; synthetic cryolite (81.3 percent Na_3AlF_6), 0.61; synthetic cryolite (81.3 percent Na_3AlF_6) plus 0.5 percent rotenone, 0.14; synthetic cryolite (83.4 percent Na_3AlF_6), 0.29; synthetic cryolite (83.4 percent Na_3AlF_6) plus 0.5 percent rotenone, 0.12; synthetic cryolite (92.3 percent Na_3AlF_6) plus 1 percent Lethane spreader, 0.34; synthetic cryolite (92.3 percent Na_3AlF_6) plus 0.5 percent rotenone, 0.16; barium fluosilicate (75 percent $BaSiF_6$), 1.03; barium fluosilicate (75 percent $BaSiF_6$) plus 0.5 percent rotenone, 0.23. In the Tallulah experiments there were approximately 4 times as many aphids in the calcium arsenate and 1-1 mixture of calcium arsenate and sulfur treatments as in the checks, 5 times as many in the calgreen and 8 times as many in the di-calcium arsenate plots as in the checks. The cryolites and other treatments also increased the aphid populations considerably. In the Florence experiments the increase in aphids in the plots treated with barium fluosilicate was about equal to the calcium arsenate plots, but where 0.5 percent rotenone was added to the barium fluosilicate, the population was only one-fourth as great as in the calcium arsenate plots. The mixtures of calcium arsenate, nicotine bentonite, and nicotine tannate also held the aphid populations to less than one-half of those in the calcium arsenate plots. The populations in the plots treated with cryolites containing different percentages of sodium fluoaluminate likewise averaged less than one-half as heavy as in the calcium arsenate plots, and where 0.5 percent rotenone was added to the cryolites the populations were only about one-seventh as great as in the calcium arsenate treatments. Derris dust, cube dust, and nicotine sulfate were also added to the calcium arsenate used in other tests at Florence and in no case did a damaging aphid population develop in any of the plots that received rotenone treatments throughout the season. However, at Tallulah, a dust containing rotenone, 0.6 percent; Avirol, 1 percent; water, 1 percent; peanut oil, 0.5 percent, with talc as a carrier, applied after the infestations became heavy, failed to give satisfactory control. The heavy infestations were satisfactorily controlled with one application of lime and nicotine sulfate containing 3 percent nicotine.

New host plant of pink bollworm.--In the examination of 1,063 green seed capsules of Malvaviscus drummondii (Turk's cap) collected near lightly infested cotton fields at Brownsville, Tex., on September 15 L. C. Fife with the assistance from the Division of Pink Bollworm and Thurberia weevil Control found 1 larva of the pink bollworm (Pectinophora gossypiella (Saund.)). The determination was later verified by C. Heinrich. Additional examinations of 893 green seed capsules were made on October 5, but the results were negative. This appears to be the first record of M. drummondii as a host of the pink bollworm. The plant is widely distributed in woods, thickets, and along roadsides in southern and eastern Texas, and is also occasionally cultivated as an ornamental. Flower buds and green seed capsules of other malvaceous plants, including Anoda pentachista, Sida angustifolia, Sida hastata, Wissadula holosericea, Malachra capitata, Malvestrum spicatum, and Hibiscus rosa-sinensis were examined during September, all with negative results. Large quantities of plants of these species have been caged for possible emergence of pink bollworm moths.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Inspection.--Inspection of the cotton crop is begun each year when cotton reaches the blooming stage and is continued through the maturity of the crop. These annual inspections are made for the purpose of obtaining data relative to the status of the pink bollworm infestation in regulated areas, and in order to locate any infestation outside of the regulated areas while still in the incipient stage. During September gin-trash inspection was continued in Texas, Louisiana, Mississippi, Alabama, Georgia, Florida, and Arizona, as well as in certain areas in Mexico adjacent to the border. Several findings of importance were made during the month. The first was at Anahuac, Nuevo Leon, Mexico, where several specimens of the pink bollworm were found for the first time. The other findings were in Texas, and involved Tom Green and Concho Counties, in the west-central part of the State. Inspection in all other areas was negative, including the Salt River Valley and Coolidge areas of Arizona, where worms were found last season.

Stalk destruction.--Field clean-up operations have been carried on each season in the lower Rio Grande Valley and Coastal Bend districts of the south Texas regulated area since the discovery of pink bollworm infestation in the counties comprising these districts in 1936 and 1938, respectively, in an effort to eradicate this very destructive cotton pest from this region. It is the policy to inaugurate control measures immediately as fields become available following the harvesting of the cotton crop, and stalk-destruction work was well advanced this season in the lower valley district by the middle of August. Inspection of the 1939 cotton crop during July and August indicated there was a considerable increase in pink bollworm infestation in the southern part of Cameron County and lighter infestations in all other regulated counties. A light pink bollworm infestation was also found for the first time in several counties lying outside the south Texas regulated area, but adjacent thereto. The stalk-destruction program was interrupted to a considerable extent during September by heavy rains which fell over practically all of the south Texas area during an approximate 2-week period. This, of course, retarded the work in all areas and prevented a considerable part of the cotton acreage being in compliance as to having all living stalks removed from fields in the lightly infested zone of the lower valley district by September 15, in order to be eligible for the payment of 50 cents per acre, to assist farmers in this work. The Federal Government is paying all expense incident to stalk removal in the heavily infested and generally and substantially infested zones. All stalks had been removed from the heavily infested zone in the southern portion of Cameron County and plowing of stubble was in full force at the time the rains began. This same condition existed over a considerable portion of the remainder of the lower valley district. During the last week in September stalk-destruction work made rapid headway, and very few fields of stalks were standing at the close of September 30. The plowing out of stubble also made very satisfactory progress, approximately 500 acres remaining unplowed at the end of the month. Those fields in the lightly infested zone in which stalks were destroyed after September 15 will, of course, not be in line for Federal payment for destruction of stalks, but stalks were destroyed prior to October 1 to comply with the State regulation to that effect. In the Coastal Bend counties, all of which lie within the lightly infested area, very few stalks remained standing at the end of September, but considerable plowing out of stub cotton remained to be done. Approximately 5,000 acres of cotton land was in noncompliance in that district on October 1 in regard to participating in payment from the Federal Government for stalk-destruction work, but it was expected that most of this acreage would be in compliance with the State proclamation requirement, which is October 15. Cooperative stalk-destruction work in the lower Rio Grande Valley of Mexico made very good progress during September despite approximately 2 weeks of rainy weather during the middle of the month. Eleven inspectors of this Division with cars assisted the Mexican inspectors in this work. At the close of September, 4,234 of the 4,833 growers in the Mexico areas had either completed plowing their cotton lands or were working toward completion, and a determined drive was under way to start the remaining growers to work.

Revision of Federal pink bollworm quarantine.--During September the Federal pink bollworm quarantine regulations were amended to include the Texas counties of Dimmit, Duval, Frio, Jim Hogg, La Salle, Maverick, Webb, Zapata, and Zavala, because of the finding of new areas of pink bollworm infestation. This amendment also added okra to the list of articles requiring certification when moved from regulated areas. This action was brought about because of the finding of a light pink bollworm infestation in okra in the lower Rio Grande Valley district by the Bureau Research Division in August. Several additional findings of pink bollworm infestation in okra were reported in September. A permit system for the handling of okra was completed and approved in September, and the placing of all okra producers under dealer-carrier permit is expected to begin early in October. In Cameron County, particularly in the area where cotton was rather heavily infested with the pink bollworm, okra growers were asked to cooperate with the control program by grubbing out all of their spring-planted fields. This comprised some 50 fields in the area near Brownsville, several of which were found to be infested with the pink bollworm. All of these okra plantings were destroyed by the close of September. In other sections owners are asked to destroy their okra plantings immediately after inspection shows them to be infested. Good cooperation has been given in this work.

Situation in the Big Bend.--In the Big Bend section of Texas and Mexico interest has recently been centered on the outcome of the joint international program, inaugurated in the spring of 1938 in an effort to reduce the extremely heavy pink bollworm infestation in the Presidio-Ojinaga section of the Big Bend. Evidence during the past few months has definitely pointed to a very satisfactory outcome of this 2-year plan, which was brought to a close with the maturity of the 1939 cotton crop. The absence of pink bollworm damage in the cotton crop in September has eliminated all doubt as to the remarkable success of the measures carried out in this area separated by an international boundary, through cooperative efforts of the two countries. At Presidio around 700 bales of cotton were ginned for the period, and it is not believed any bale will grade lower than middling, with a very high percentage grading strict middling. In the Ojinaga, Mexico, area, the few bales ginned for the month graded middling or better. It is estimated that there are less than 1,500 acres in cotton in the Presidio section this year, whereas normally this figure would be around 3,000 acres. Many farmers in this area now express regret at not planting their allotted acreage under the A. A. A. program. It is believed that this reduction in acreage is largely due to fear of the pink bollworm, while the optimism of the growers for next season is due entirely to the present pink bollworm status. It would seem that this attitude clearly indicates the farmers' confidence in the control measures that have been in effect for the last 2 years. Most of the growers now plan to plant their full allotment next season. Cotton growers in the Ojinaga area also appear to realize and appreciate what has been accomplished through control efforts and state that they intend to plant a much larger acreage next year, as they now see that cotton can be produced without heavy losses from pink bollworm.

Wild-cotton eradication work in southern Florida.--The eradication of wild cotton has been carried on in southern Florida and adjacent keys each season since the discovery of pink bollworm infestation in these plants some years ago. This wild cotton is perennial and grows into trees. It has no commercial value, but serves as a host to the pink bollworm, from which it was discovered this most destructive of cotton pests was migrating to domestic cotton plantings in northern Florida and southern Georgia. Wild-cotton eradication is carried on through the provision of Work Projects Administration allotments, supplemented by funds provided by this Bureau. Eradication work was inaugurated this season on the Keys subdistrict on September 18, with approximately 22 W. P. A. laborers. By the end of the month this force had been increased to 39. The situation relative to the destruction of wild cotton plants is very favorable. A total of 660 acres was cleaned for the period worked during September and only 2,506 wild cotton plants were found, of which about 2 percent had mature fruit. A total of 300 mature bolls were inspected with negative results as to pink bollworm infestation. Efforts were begun some time ago toward obtaining authority for the establishment of a C. C. C. camp on Cape Sable, where the greater portion of wild cotton occurs, to aid in this undertaking, and arrangements to this end were finally consummated. During the first part of September inspectors of the Florida division gave considerable assistance to the Army and Forest Service in the erection of a side camp at Royal Palm State Park, incident to the repairing of roads to Cape Sable and the establishment of the main C. C. C. camp. The Forest Service occupied the side camp during part of the period, with 75 enrollees, and began repairs on the Cape Sable roads. Not a great deal of progress was made, however, toward establishment of the permanent camp, owing to bad weather, mosquitoes, and lack of adequate road equipment. Toward the end of September adequate machinery was received, and it was anticipated that the work incidental to the establishment of the C. C. C. camp would be accelerated.

Thurberia-plant eradication.--An effort has been under way for a number of years to eradicate the Thurberia plant from the mountain ranges in southern Arizona adjacent to cotton plantings. This wild plant is closely related to domestic cotton and is infested with Thurberia weevil, an insect very similar to the common boll weevil, and attacks domestic cotton in much the same way. A recheck of the Tortillita Mountains, which were covered in 1935 and 1936, when this work was first begun, is now in progress. Despite the fact that we were unable to get our requisitions for W. P. A. labor filled during September, good progress was made in the work of locating and destroying Thurberia plants in this mountain range. During the period 1,141 man-days was applied to Thurberia eradication. A total of 8,640 acres was covered and 5,241 Thurberia plants were located and destroyed.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Three types of cryolite give similar control of tomato fruitworm.--As a result of experiments in three fields of early crop tomatoes, J. Wilcox, of the Alhambra, Calif., laboratory, reports that the percentage of tomato fruits damaged by Heliothis armigera (Hbn.) was reduced from an average of 14.4 percent in undusted plots to 3.2, 3.2, and 3.1 percent in plots dusted with imported synthetic cryolite, natural cryolite, and domestic synthetic cryolite, respectively. This constitutes about 78-percent control. Twenty different field plots were dusted with each type of cryolite. Half of these were dusted with undiluted cryolite and gave better results than did half dusted with cryolite diluted with talc to contain 70 percent of sodium aluminum fluoride (Na_3AlF_6). A bait containing corn meal and cryolite (10-1) by weight, gave similar results to the diluted cryolite dust mixture. A bran-cryolite bait gave intermediate results, whereas a bran-cryolite-corn oil bait, a sawdust-cryolite-corn oil bait, and undiluted calcium arsenate dust, gave inferior results.

Lygus species injurious to sugar beet seed.--O. A. Hills, of the Phoenix, Ariz., laboratory, reports that a recent survey of 25 fields of sugar beets grown for seed in the Salt River Valley of Arizona in 1939 demonstrated that two species of Lygus, principally Lygus pratensis oblineatus (Say) and L. hesperus Knight, were found to be associated with the production of a large percentage of nonviable seed. Populations of other insects in the seed beet fields did not correlate with the percentage of seed viability. Similar surveys were made in the beet seed growing districts of Albuquerque, N. Mex., and Salt Lake City, Utah, and although a definite trend was observed toward a greater production of nonviable beet seed in the presence of Lygus populations, the samples examined were too few to serve as a basis for definite conclusions. An examination of seed borne by plants grown in cages stocked with Lygus, involving the introduction of 1,551 Lygus adults and nymphs on seed beets during their prebolting stage, demonstrated great differences in the production of seed and in the percentage of viability of the seed, in the cage where these insects were introduced, as compared to a similar cage where the beets were grown in the absence of insect infestation. Specifically, there were 1,387 grams of beet seed showing a viability of 91.0 percent produced in the cage where Lygus was excluded, as compared to only 68.4 grams possessing a viability of 0.33 percent produced in the cage where Lygus was present. A seed analysis from similar isolation cages where leafhoppers of the genus Empoasca had been introduced demonstrated that, while the yield of seed was reduced materially by heavy infestations of these leafhoppers, the viability of the seed was not greatly affected.

Little change in percentage of bulbs infested by narcissus bulb fly in Pacific Northwest.--The annual survey conducted during the summer of 1939 by C. F. Doucette, of the Sumner, Wash., laboratory, and his associates for the purpose of determining the extent of narcissus bulb infestation by Merodon equestris (F.) disclosed that the percentage of infested bulbs ranged from less than 1 to approximately 21 percent, with an average of 5.3 percent out of 29 stocks examined in Washington and Oregon. The variety King Alfred was examined in all cases and double-nosed bulbs were used in order to avoid the influence of varietal and size factors. In most instances the bulbs had been graded so that they were well mixed and 10 samples of 100 bulbs each were usually taken for examination. Where graded bulbs were not available 40 samples of 25 bulbs each were examined. During the preceding 4-year period the percentage of bulbs infested by the bulb fly in the same locations ranged from 4.4 to 5.5, indicating that for the last 5 years there has been, in general, no very extensive change in the extent of infestation by M. equestris.

Cryolite effective against hornworms on cigar-binder tobacco.--F. S. Chamberlin, A. H. Madden, and L. L. May, of the Quincy, Fla., laboratory, report that a preliminary control experiment with a cryolite dust mixture directed against Protoparce quinquemaculata (Haw.) and Protoparce sexta (Johan.) on the newly introduced cigar-binder type of tobacco indicated that this material was effective against hornworms under the conditions encountered. The cryolite dust mixture containing 80 to 85 percent of sodium aluminum fluoride applied to the tobacco at weekly intervals throughout the period of infestation by hornworms exerted a more effective control of these pests than did a paris green and lime mixture (1-6). Owing to the burning hazard accompanying the use of the paris green dust mixture, applications of this poison were directed into the center of the space between the tobacco rows, whereas the cryolite was applied directly to the tobacco foliage, as this material does not ordinarily burn tobacco. The diverse methods of application produced relatively greater deposits of cryolite on the tobacco leaves than did the paris green mixture, which possibly explains, at least in part, the greater effectiveness of the cryolite. Even though the cryolite dust mixture was applied directly to the tobacco foliage under very adverse weather conditions the leaves showed only a slight trace of burning. The paris green and lime mixture, however, burned the leaves appreciably. Light deposits of cryolite washed quite readily from the tobacco leaves during showers but heavy, uneven deposits of the material remained as an objectionable residue upon the cured product. While the results of this experiment indicate that cryolite possesses definite promise as an insecticide for controlling hornworms in the Florida district, the physical character of the material now available must be improved before it can be used successfully as a dust mixture by the tobacco growers. These general conclusions were confirmed by the experience of a local tobacco grower who used cryolite on his tobacco.

Dichloroethyl ether protects melons from wireworms.--Results of experiments by M. W. Stone, of the Ventura, Calif., laboratory, indicate that Zucca melons can be protected effectively against the sugar beet wireworm (Limonius californicus (Mann.)) by applications of a water solution of dichloroethyl ether at concentrations ranging from 2 to 4 cc. per gallon, applied at the rate of 1 quart of the solution to each hill prior to the planting of the seeds, supplemented by a second application of the same dilution and dosage 3 weeks later, without causing detectable injury to the plants. In the process of conducting these experiments shallow excavations approximately 1½ inches deep and 8 inches in diameter were made as a foundation for each hill, and the dichloroethyl ether was applied at concentrations of 2, 3, and 4 cc. per gallon of water at the rate of 1 quart of the solution to each excavation in the respective experimental plots. After the solution had entered the soil four seeds of the Zucca melons which had previously been sprouted were planted in the excavation and a small quantity of the treated soil was placed over the seeds. Similar plots which did not receive dichloroethyl ether applications were retained as checks. At the end of the first week the hills treated with the 2-cc. concentration had an average of 0.71 wireworm larva per hill, the 3-cc. concentration had 0.25 larva per hill and the 4-cc. concentration 0.32 larva per hill, whereas there were an average of 6.4 larvae per hill in the plots not receiving dichloroethyl ether treatments. Examinations at the expiration of 3 weeks from the initiation of treatment disclosed that a total of 10.4, 10.8, and 6.7 percent of the melon plants were killed by wireworms in the 2-, 3-, and 4-cc. dilutions, respectively, whereas 65 percent of the melon plants were killed in the plots not receiving any treatment. At the expiration of 32 days, the second application having been made in the meantime, the percentage of the melon plants killed had increased to 27, 18, and 13, respectively, for the three different dilutions of dichloroethyl ether whereas there was no increase in the number of plants killed in the check plot, which during the interval had received one treatment of the dichloroethyl ether application in order to prevent further reduction in the number of plants.

Control of red spider on greenhouse cucumbers.--Tests completed recently by C. A. Weigel and G. V. Johnson, of the Beltsville, Md., laboratory, indicate that, on the basis of examinations made of all living red spiders (Tetranychus telarius (L.)) found on representative samples of cucumber foliage from plants grown in the greenhouse, which were given a total of nine applications of a derris-pyrethrum-sulfonated castor oil spray, this combination proved superior to an equal number of applications of sprays composed of a commercially prepared thiocyanate, thus confirming the results obtained during the preceding three seasons. Under the conditions of this experiment there were no differences revealed in the numerical production of cucumbers from plants treated with these two sprays, but the per-plant production was considerably reduced in the check plots. It should be emphasized, however, that the plants in the check plots produced a higher percentage of Grade No. 1 cucumbers than the plants subjected to either of the spray treatments, indicating the possibility of mechanical injury to the flowers or young cucumbers by the spray. The derris-pyrethrum-sulfonated castor oil spray did not cause detectable injury to the cucumbers but some injury, directly attributable to the treatment, resulted on the plants to which the thiocyanate spray was applied.

INSECTS AFFECTING MAN AND ANIMALS

Bonneville Dam and its relation to mosquito pest.--H. H. Stage, of the Portland, Oreg., laboratory, reports the following observations on the effect of the construction of the Bonneville Dam on mosquito production: "Since the controlled elevation of water surface in the Columbia River has been radically changed by the construction of the dam, it is apparent that old breeding areas may now be permanently flooded and entirely new areas be rendered suitable for oviposition by Aedes vexans Meig. and A. lateralis Meig. For the third consecutive year data have been recorded on the relationship of the construction of the dam and mosquito breeding. These data have included records on the numbers of larvae and adults occurring above and below the dam by field inspections and light traps, respectively. At present it appears that the mosquito population above the dam has been considerably reduced. In certain restricted localities there is no longer any pest whatever since the original egg beds are now permanently under several feet of water. It is fortunate that the banks are generally steep, rather than gently sloping as in many of the original willow flats. The total number of acres permanently submerged amounts to 4,250, of which 2,660 acres was covered with a dense growth of willows and cottonwoods, regarded as mosquito-breeding areas. The number of acres periodically flooded by an average high water under present (controlled) conditions now amounts to 878, or a reduction of some 1,782 acres. This total of 878 acres, now considered as potential mosquito-breeding areas, occurs in greater or lesser size from the dam to The Dalles. Mosquito breeding is considerably reduced therefore at practically every point along this 50 miles of river. In the vicinity of Hood River, for example, some 286 acres of mosquito-breeding grounds has been flooded by natural water levels (before construction of Bonneville Dam). This acreage has been reduced to 62 acres by controlled water levels (after construction of Bonneville Dam).

Miami Beach, Fla., eliminates sandfly-breeding areas.--J. B. Hull, of the St. Lucie, Fla., laboratory, reports that following a survey by the personnel of his station, to determine the sandfly-breeding areas in the vicinity of Miami Beach, that city eliminated the areas within the city limits by filling with spoilage pumped from the bay. Apartment buildings are now being erected on the reclaimed areas.

Mixtures containing derris and nicotine for control of Gulf coast tick apparently injure eyes of animals.--Tests conducted at the Valdosta, Ga., laboratory on various tickicidal materials indicate that mixtures containing derris and nicotine, when repeatedly applied to the insides of the ears of animals to kill or repel the Gulf coast tick, cause injury to the eyes. The injury is manifested by the appearance of a white opaque area in at least a part of the affected eye.

Diphenylamine a promising tickicide.--Diphenylamine, recently shown to be an excellent screwworm larvicide, in preliminary tests is indicated to be a good tickicide against the Gulf coast tick (Amblyomma maculatum Koch).

FOREIGN PLANT QUARANTINES

Insect passengers from Europe.--When the S. S. Veendam arrived at New York on September 6 from the Netherlands, several adult specimens of Pieris rapae (L.) were taken alive in a passageway just outside of the refrigerator room. This ship brought back a large number of American citizens returning home before the outbreak of the European War and it was necessary to take on an excess of staple stores before sailing. Owing to a lack of space, a considerable quantity of cabbage was piled outside of the refrigerator. The cabbage was evidently infested with immature stages of P. rapae. This note is of interest in that it illustrates the possibility of insect pests, taken on board in some foreign country in the immature stages, completing their life cycle while in transit and flying ashore when the ship docks at some United States port.

Bulb inspection.--Although reports of bulb inspections are far from complete, it is evident that interceptions of Botrytis galanthina on Galanthus bulbs are far more numerous than they were last year. In addition, there have been over 50 interceptions of an undetermined sclerotial disease on *Galanthus* bulbs. *Ditylenchus dipsaci* has been found on *Chionodoxa*, hyacinths, bulbous iris, *Muscari*, and *Scilla*, infestation being rather light in general.

Entomological interceptions of interest.--Six living larvae of the fruitfly *Anastrepha mombinpraeoptans* Sein were intercepted at New York on May 15 in a mango in ship's stores from Cuba. Living and dead larvae of the Mediterranean fruitfly (*Ceratitis capitata* Wied.) were intercepted at Boston on July 23 in tangerines in ship's stores from Brazil. A living larva of the elaterid *Ischnodes sanguinicollis* Panz. was taken at Washington, D. C., on May 29 in soil around azalea in the mail from Germany. A living specimen of the tingitid *Acalypta musci* (Schr.) arrived at Chicago on July 12 with moss packing around unidentified plants in the mail from Switzerland. A living larva of the weevil *Listronotus latiusculus* (Boh.) was found at Brownsville, Tex., on June 25 in a carrot in baggage from Mexico. Living specimens of the scale insect *Aulacaspis mangiferae* Newst. were intercepted at San Juan, P. R., on June 3 on a mango in baggage from Trinidad. A living adult of the scarabaeid *Dyscinetus picipes* (Burm.) was taken at New Orleans on April 22 on a pineapple fruit in cargo from Cuba. A specimen of the pentatomid *Mecistorhinus piceus* (P. B.) var. arrived at Galveston, Tex., on April 20 with banana debris in cargo from Guatemala. Two living larvae of the turnip gall weevil (*Ceutorhynchus pleurostigma* Marsh.) were intercepted at New York on February 22 in white turnip roots in ship's stores from Algeria. Living larvae of the pyralidid *Diaphania indica* (Saund.) were collected on March 3 on watermelon leaves in the field at Inarajan, Guam. A living adult of the cyphonid *Ora nigricornis* Champ. was found at Charleston, S. C., on May 29 on a banana leaf in cargo from Guatemala. A living specimen of the earwig *Paracosmia tolteca* (Sc.) was intercepted at San Francisco on March 14 with orchids in express from Mexico.

DOMESTIC PLANT QUARANTINES

Under Secretary Wilson visits grasshopper areas.--As head of the Great Plains Regional Traveling Conference, the Under Secretary, M. L. Wilson, while touring the Southwest relative to various agricultural projects, visited on August 28-30, certain areas in which grasshopper control activities were carried on last season. Observations were made of grasshopper infestations of various types in New Mexico and Texas, including areas in the latter State from which the long-winged hopper has been largely eliminated through control operations.

Losses from grasshoppers not more than 2 percent in heavily infested areas of Great Plains.--In determining the results of the current year's grasshopper baiting campaign in the Great Plains region, it is found there has been a high degree of control, owing to the combined effects of the work carried on by the Bureau in cooperation with local agencies in controlling migratory species, and the work conducted by farmers on their own premises against crop hoppers. Losses are confined principally to isolated farms where no effort was made to control the grasshoppers and to localized light-soil areas. Some of these farmers reported complete loss; others from 10 to 25 percent or more, but these areas were so small that it is believed the average loss from hoppers last season did not exceed 2 percent of the value of the crops in the heavily infested areas. This was not entirely due to artificial control operations, but to man's effort and natural factors combined. The gray flesh flies, which lay tiny maggots on adult grasshoppers, appeared about 3 weeks earlier than in 1938 and infested about 25 percent of the hoppers in some localized spots. In limited areas, diseases of grasshoppers played a part. This was most noticeable in the Mississippi Valley States. The rains assisted in the control work in some respects, but hindered man's efforts to spread bait. Rains in April brought out a tender growth of vegetation, which tended to prevent migration of grasshoppers and resulted in large effective kills by applications of poison bait.

Several million dollars saved in one Minnesota county through grasshopper control.--In the Red River Valley of Minnesota, it has been estimated that more than 5 million dollars' worth of crops was saved from grasshopper destruction in half of 1 county. The reporting State cooperator declares he has gone into this estimate very carefully among farmers and growers in that section, and that they definitely agree upon the savings reported and attribute practically the entire crop in that half of the county to the results of the effective baiting program during this season.

Grasshopper surveys.--Following the survey of adult grasshoppers, which was completed in September, a survey of grasshopper eggs was begun after a series of regional meetings with supervisors, at which methods and procedures were outlined. By the close of September the egg survey was well under way in all States except Arizona and Arkansas, where the egg laying was late. The reports thus far indicate that the grasshopper infestation next season will be more serious in some of the northern Great Plains States than had been indicated by the adult survey.

White-fringed beetles not found at seven formerly infested localities.--Intensive eradication measures have been repeatedly applied in the current season at several isolated points where light infestations of white-fringed beetles were found last year, with the result that thorough inspection has failed to show that any such infestation exists at the following points: Taylorsville, Collins, and De Lisle, Miss.; Baton Rouge and Lake Arthur, and the parishes of Saint Tammany and Plaquemines, in Louisiana. Fumigation with carbon disulphide in the spring was the method employed at three of the above points, including Baton Rouge, where a rather severe infestation of larvae was found in the spring. In addition, intensive applications were made of herbicidal spray and of calcium arsenate or cryolite dusts.

Data on emergence of white-fringed beetles.--In order to determine the most effective time for applying control measures, a study has been made this year of the period of emergence of white-fringed beetle adults in the various infested areas. Cages were placed at various points and it is believed that the trapping records gave a reasonably accurate indication of adult emergence. It was found by the above method and by field inspection that emergence began late in May in most of the areas and continued until late in August, although in New Orleans, La., and Saucier, Miss., emergence continued throughout September, and at Monroeville, Ala., beetles were plentiful that month. Adult beetles of Pantomorus peregrinus Buch. continued to be found after those of P. leucoloma Boh. had disappeared.

July 14 marked the high point of emergence at Florala, Ala., New Orleans, La., and Gulfport, Bolton, and Carriere, Miss., and the latter point had another peak on June 8. The peak emergence at Saucier, Miss., occurred about August 19.

White-fringed beetle activities.--The control activities which have been carried on intensively since the first of June throughout the infested areas of Florida, Alabama, Mississippi, and Louisiana were largely discontinued after the first week in September, owing to the scarcity of beetles. In the eradication areas, such as that at Mobile, Ala., dusting with calcium arsenate was continued as long as a beetle could be found and proved very effective in ridding the area of adults. Suppressive measures were also applied at Florala, Ala., and Laurel, Miss. The cotton-ginning and peanut-picking operations in the infested areas in September necessitated increased activity on the part of the regulatory force in making the necessary arrangements with operators as to measures essential to the issuance of dealer-carrier certificates. In the Gulfport and Bolton, Miss., areas, cotton from infested fields was fumigated before being taken to the gins. It was found that carbon disulphide produced a 100-percent kill of adult beetles.

White-fringed beetle clean-up activities declared a godsend.--"The sections of our city where this project (white-fringed beetle control) has been in effect is by far cleaner and more respectable looking than at any time since I can remember, and that is a long time," declared the manager of a southern city in a recent letter, recounting the tremendous volume of debris that has been disposed of and urging an extension of the activities to cover the entire city. While the comment has an amusing angle, we believe it represents a wholesome attitude, in that the clean-up work is found to go far, not only toward controlling the infestation but also in abating unsanitary conditions and eliminating fire hazards.

Status of peach mosaic disease.--In the 1939 inspection work which has now been completed in most of the States, the peach mosaic disease was found in 53 counties of 7 States. There are 10 counties in which the disease has been found in the course of the cooperative Federal-State campaign of the last 4 years, in which no such disease was found in 1939. Of these counties, 7 are in Texas, 2 in Colorado, and 1 in Utah. The incidence of the disease has increased in the last year, however, the highest percentages of increase occurring in California, Arizona, and Oklahoma. In Colorado, where growers and others have been very active in removing diseased trees as soon as they are located, there was a reduction of 441 mosaic trees in the past year, 4,654 having been located this season.

Peach mosaic found in another Texas county.--A diseased peach tree found last July in Gregg County, Tex., has been definitely determined as affected with peach mosaic disease. This is the first report of peach mosaic from that county.

Fall inspection of peach nursery stock.--The recent reinspection of peach nursery and budwood properties in the regulated areas of the Southwest has resulted thus far in finding the peach mosaic disease in two Texas orchards. This is theonly nursery, of those which were found eligible for certification last spring, in which mosaic trees were found on reinspection just prior to defoliation.

Peach-tree-removal work.--In September the work of taking out diseased, abandoned, and escaped peach trees was continued in Alabama, Arkansas, California, Colorado, Georgia, Oklahoma, South Carolina, Tennessee, Texas, and Utah. An average of 459 relief workers was employed on the project. Requests for the removal of such trees have come from the growers of several States. Of special note is the activity on the part of 26 Georgia peach growers who have recently destroyed, or "dehorned" for removal, over 4,700 peach trees which they inspected and found to be phony. In Oklahoma, N. Y. A. labor supplied by the county agent of Bryan County destroyed over 200 mosaic trees, which completed the destruction of the entire 400 or more such trees found infected in that county this year. The disease is not known to exist elsewhere in Oklahoma.

Nurserymen of Texas and Oklahoma provide growers with healthy stock for diseased peach trees removed.--The Nurserymen's Association of Oklahoma is furthering the control of the peach mosaic disease by agreeing to furnish healthy young nursery trees to growers who remove diseased trees from their property in accordance with the Federal-State cooperative program. Such assistance has also been extended by the Texas Nurserymen's Association in support of the program for the control of the phony peach and peach mosaic diseases.

The phony peach situation.--Throughout the 10 lightly infected States there has been a reduction of nearly 86 percent in the phony peach disease since 1936, less than 400 phony trees having been found in these States in the current season up to September 1. No phony trees were found this year in 3 formerly infected States--Indiana, Maryland, and Pennsylvania. The disease has apparently been eliminated also from nearly 100 entire counties in the more heavily infected States, and throughout the entire region there were 209 counties formerly known to be infected, in which no phony peach disease was found this year.

Correction in statement as to phony peach disease in Illinois.--On page 30 of the News Letter dated September 1, 1939, a statement was carried to the effect that no phony peach disease was found in Illinois in 1937 or 1938. It is desired to qualify that statement with the information that two phony infected trees were found in that State in 1937 and none in 1938.

No sweetpotato weevils found in eight formerly infested counties.--On checking up on the status of sweetpotato weevil infestations since the control and eradication activities were begun cooperatively with the States a little over 2 years ago, it is found that there are eight counties, formerly known to be infested, in which the weevils could not be located in this season's inspection. These counties are Conecuh in Alabama; Camden and Charlton, in Georgia; Greene, Jeff Davis, and Lawrence, in Mississippi; and Smith and Upshur, in Texas. A marked reduction in the number of infested properties in other counties in the regulated areas has also been effected.

Sweetpotato weevil survey in Arkansas and Texas.--The survey of properties outside quarantined areas was extended in September into seven counties in southwestern Arkansas, including the commercial area bordering on Louisiana. No sweetpotato weevils were found. In Texas, preliminary surveys in several nonregulated counties resulted in finding an infestation in parts of the counties of Bastrop, Lee, Milam, and Williamson, and weevils were also located in Walker County.

Species of Ipomoea infested with sweetpotato weevils.--In a recent cursory survey of wild host plants of the sweetpotato weevil in the heavily infested areas of Baldwin and Mobile Counties, Ala., the weevils were found infesting the following species of the genus Ipomoea: pes-caprae, littoralis, speciosa, pandurata, caroliniana.

Violations reduced 15 percent in past year.--The number of shipments moved in apparent violation of Federal domestic plant quarantines in the fiscal year 1939 has been reduced more than 15 percent from the previous year, according to a recently prepared summary of interceptions. In the 3,641 infringements found by transit inspectors in the year ended June 30, 1939, articles not meeting quarantine requirements were found to have been consigned to every State in the Union except Nevada and Rhode Island, as well as to Alaska, Canada, the Canal Zone, and Puerto Rico. Cooperators in California reported 78 apparent violations of Federal quarantines and those at Jacksonville, Fla., 131 such violations.

Shipments inspected in past year.--Over a million shipments of nursery stock, plant products, and other restricted articles were inspected in the fiscal year 1939, to determine whether they had been certified in advance in accordance with quarantine requirements. Such inspections were made at railway centers in Atlanta, Boston, Chicago, Cincinnati, Council Bluffs, Dallas, Detroit, Indianapolis, Jacksonville (Fla.), Kansas City, Minneapolis, New York, Omaha, Philadelphia, Pittsburgh, Springfield (Mass.), St. Louis, and St. Paul.

Transit inspectors find live insects in shipments.--Two violations of the Insect Pest Act were recently noted by transit inspectors and reported to the responsible Division--one consisting of a shipment of live crickets, seen at Cincinnati; the other of live grasshoppers,seen at New York City.

Citrus canker work.--The activities in September were continued in Harris County, Tex., principally in Houston and suburbs. Over 3,000 properties and nearly 42,000 citrus trees were inspected during the month. Of this number over 34,000 were destroyed. No infections of citrus canker were found. R. N. Dopson, Jr., who was assigned temporarily to the White Fringed Beetle Project during the summer months, returned to the citrus canker work on September 1.

INSECTICIDE INVESTIGATIONS

Insecticidal possibilities of antimony salts.--C. M. Smith has just finished reviewing all the available literature concerning insecticidal tests and recommendations for the use of antimony compounds in the control of insects, and has prepared a paper on the subject which will, it is hoped, be presented at the meeting in New York City of the Eastern States Branch of the American Association of Economic Entomologists, to be held November 16 and 17.

The paper may be summarized as follows: Of all the antimony salts available, only potassium antimonyl tartrate, known as tartar emetic, has found any real application in the field of insecticides. It has long been recommended for the control of numerous species of ants, has shown promise in the control of West Indian and Mexican fruitflies, and has most recently become the accepted means of chemically controlling gladiolus thrips, with promise that it will also be applicable to other thrips such as those on iris and lemons. A great variety of antimony salts are available for further experimentation. Their price, materially higher than that of arsenic, will preclude their use except under special circumstances. They are quite toxic to man, but in a considerably lesser degree than arsenic, and the phytocidal activity also appears to be much less; it is this fact that may give them some special usefulness. Spray residues may reach considerable magnitudes but, at least in the case of those from the use of tartar emetic solutions, are apparently easily removed by rain or washing. Methods for determining the residues are fairly satisfactory with regard to both convenience and delicacy.

Differences in types of cryolite demonstrated.--R. H. Carter has prepared a note for the Journal of Economic Entomology in which he points out that the three types of insecticidal cryolites on the American market differ markedly with respect to pH and titratable acidity. The synthetic product of domestic manufacture is quite basic, the pH running from 7.45 to 8.10; the natural product from Greenland is more nearly neutral, running from 6.00 to 7.10 in pH; and the imported synthetic material is almost always quite acid, the pH running from 6.10 to 3.60, and the titratable acidity (methyl red indicator) amounting in some cases to the equivalent of 2.6 percent sulfuric acid. It is suggested that this acidity may have some connection with the phytocidal effect of some cryolites.

BEE CULTURE

Occurrence of American foulbrood governed by age of larvae.--A recent study by A. W. Woodrow, of the Intermountain States Bee Culture Laboratory, at Laramie, Wyo., indicates that only young larvae are in danger from infection by American foulbrood. In a report on this work he states: "In connection with the tests on comparative physiological resistance or susceptibility it seemed desirable to learn the time at which the brood must be fed infected material if it is to become diseased. In one test on this question the queen of Colony No. 91 was caged on an empty comb on June 22-23. On June 29 this brood, at the age of 6-7 days (counting from the time the eggs were laid), was inserted into a badly diseased colony. The same queen was caged on June 27-28 and the resulting brood also inserted into the badly diseased colony on July 3, at the age of 5-6 days. No brood in either comb became diseased. In a second test the queen of colony 29 was caged for 5 consecutive days (July 19-24), each day on an empty, clean comb. These combs of brood were inserted into a badly diseased colony on July 26 for exposure to infection. The brood at the time of insertion ranged from eggs and hatching larvae to brood 6 to 7 days old. It is surprising that only the brood 4 days old or younger at the time of exposure to disease became infected." In short, according to these results, only larvae not more than 1 day old become infected with American foulbrood.

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